

PATENT ABSTRACTS OF JAPAN

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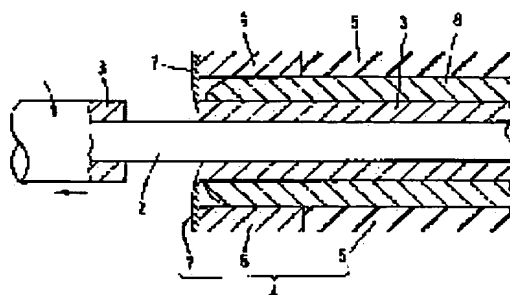
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(54) METHOD FOR REMOVING COATING OF OPTICAL FIBER

(57)Abstract:

PURPOSE: To remove the coating of an optical fiber having a small outer diameter with a hot stripper by forming a resin layer around the coating and removing the coating at that part along with the resin layer.

CONSTITUTION: A resin layer having $\geq 400\mu\text{m}$ outer diameter is formed around the coating having $\leq 300\mu\text{m}$ outer diameter, hence the coating and resin layer are integrated, and strength is increased to such an extent the shape is not lost. Consequently, the optical fiber is placed at a definite position between blades and extracted, and the optical fiber is not brought into contact with the blade or damaged. Namely, a resin layer 8 having $400\mu\text{m}$ outer diameter is molded on the intermediate part 50mm long of the optical fiber 1 applied with a coat 3 having $250\mu\text{m}$ outer diameter on an optical fiber 2 having $125\mu\text{m}$ outer diameter. The part coated with the resin layer 8 is then clamped by a hot stripper 4 to allow the blade 7 to intrude into the coat 3. The state is kept for 30sec, and then the coat 3 is removed along with the resin layer 8.



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CLAIMS

[Claim(s)]

[Claim 1] The covering removal approach of the plastic coated fiber characterized by removing covering of the part with a resin layer by the hot stripper after forming a resin layer so that it may become the outer diameter of 400 micrometers or more at the periphery of covering of the part to remove in the approach of removing covering of a plastic coated fiber which comes to give covering with an outer diameter of 300 micrometers or less using a hot stripper to an optical fiber with an outer diameter of 125 micrometers.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] As for this invention, a covering outer diameter is related with the covering removal approach of a thin plastic coated fiber 300 micrometers or less.

[0002]

[Description of the Prior Art] When removing covering of the optical fiber alignment end-of-line section for connection of a plastic coated fiber etc., there is an approach using a hot stripper as simplest approach. After this approach makes a cutting edge 7 eat into covering 3 and heats the covering 3 of an edge at about 100 degrees C by the heating grasping section 5 while it grasps the covering 3 of the edge of a plastic coated fiber 1 by the hot stripper's 4 heating grasping section 5, and the non-heating grasping section 6 as shown in drawing 4, it pulls a plastic coated fiber 1 in the direction of an axis, and it removes the previous covering 3 from a cutting edge 7.

[0003] Since there is a possibility that a blemish may take lessons from an optical fiber and reinforcement may fall when a cutting edge 7 contacts an optical fiber 2, an important thing is making it not contact a cutting edge 7 to an optical fiber 2 here. Especially for high intensity connection of an optical fiber, when a certain amount of reinforcement is required of the optical fiber of a part from which covering was removed, this point takes cautions.

[0004] Usually, tip spacing of the cutting edge 7 at the time of making the hot stripper's 4 cutting edge 7 eat into covering 3 is set as about 200 micrometers, and since the outer diameter of an optical fiber 2 is 125 micrometers, there is only about 40-micrometer spacing of the tip of a cutting edge 7 and an optical fiber 2. For this reason, when drawing out an optical fiber 2 and an optical fiber 2 blurs up and down, there is a possibility that a cutting edge 7 may touch an optical fiber 2. In order to prevent this, it is required at the time of drawing to make it a core-wire electrode holder not blur up and down and to make the dimension of a hot stripper and a plastic coated fiber agree. In addition, although the example of drawing 4 is the case where the hot stripper's 4 grasping section consists of the heating grasping section 5 and the non-heating grasping section 6, some which consist of the heating grasping section have the whole grasping section.

[0005]

[Problem(s) to be Solved by the Invention] However, even if it takes the above measures, in a plastic coated fiber with a small (the thickness of covering is thin) covering outer diameter, the fall of an optical fiber on the strength occurs. Table 1 is the result of removing covering of the plastic coated fiber (optical fiber outer diameter of 125 micrometers) whose covering outer diameters are 250 micrometers, 300 micrometers, and 420 micrometers 50mm by the hot stripper, and investigating the breaking strength of the optical fiber of the part. A strain rate is 10% a part for /and each measurement size n= 10.

[0006]

[Table 1]

	最低値	最高値	平均値
250 μm	1.4 kg	4.5 kg	2.3 kg
300 μm	1.3 kg	5.8 kg	3.2 kg
420 μm	4.7 kg	6.2 kg	5.9 kg

[0007] According to Table 1, if there are 400 micrometers or more of covering outer diameters, although the reinforcement of an optical fiber hardly falls, it turns out that the reinforcement of an optical fiber is falling [the covering outer diameter] clearly by 300 micrometers or less. From such a fact, when a certain amount of reinforcement (for example, about 2.5kg), such as high intensity connection of an optical fiber, was required, there was a problem that covering removal of a plastic coated fiber with a covering outer diameter of 300 micrometers or less could not be performed using a hot stripper.

[0008]

[Means for Solving the Problem] This invention offers the covering removal approach of the plastic coated fiber which solved the above technical problems, and after the configuration forms a resin layer so that it may become the outer diameter of 400 micrometers or more at the periphery of covering of the part to remove, it is characterized by to remove covering of the part with a resin layer by the hot stripper in the approach of removing covering of a plastic coated fiber which comes to give covering with an outer diameter of 300 micrometers or less using a hot stripper to an optical fiber with an outer diameter of 125 micrometers.

[0009]

[Function] In the plastic coated fiber with a covering outer diameter of 300 micrometers or less, it turned out that the cause that the reinforcement of the optical fiber of a part from which covering was removed falls is as follows as a result of investigation. When covering of a plastic coated fiber with a covering outer diameter of 420 micrometers is removed, removed covering remains in the shape of macaroni, without collapsing. That is, when sampling an optical fiber from covering, the location of an optical fiber is not changed between cutting edges, therefore an optical fiber does not touch a cutting edge and a blemish does not attach it.

[0010] On the other hand, when covering of a plastic coated fiber with a covering outer diameter of 300 micrometers or less is removed, a form collapses and removed covering does not stop the original form. That is, in this case, since it is drawn out while an optical fiber is pushed on collapsing covering and moves vertically and horizontally, when that movement magnitude is large, a cutting edge is touched, a blemish takes lessons from a front face, and a fall on the strength happens.

[0011] Then, in the case of covering outer diameter 300 micrometers or less, when a resin layer is formed so that it may become the outer diameter of 400 micrometers or more at the periphery, covering and a resin layer are united and it comes to have the reinforcement which is extent in which a form does not collapse in the case of covering removal. Consequently, it comes to be drawn out in the condition that an optical fiber is in the fixed location between cutting edges, and it is lost that an optical fiber touches a cutting edge and gets damaged.

[0012] In addition, if a resin layer is formed after making the front face of covering apply and harden the solvent which raises adhesion force, such as a primer, before forming a resin layer when it is hard to stick the front face of covering with a resin layer and a resin layer tends to separate, the adhesion force of covering and a resin layer can be heightened.

[0013]

[Example] Hereafter, the example of this invention is explained to a detail with reference to a drawing. The mold of the resin layer 8 was carried out to 50mm of pars intermedia of the plastic coated fiber 1 which gave covering 3 with an outer diameter of 250 micrometers to the optical

fiber 2 with an outer diameter of 125 micrometers as first shown in drawing 1 so that it might become the outer diameter of 400 micrometers. A plastic coated fiber 1 is the same as a plastic coated fiber with a covering outer diameter [of Table 1] of 250 micrometers, and the quality of the material of the resin layer 8 is the same ultraviolet curing mold resin as the secondary coating of a plastic coated fiber 1.

[0014] Next, the part in which the resin layer 8 was formed was pinched by the hot stripper 4, and the cutting edge 7 was made to eat into covering 3, as shown in drawing 2. Spacing of the cutting edge 7 of the upper and lower sides of the hot stripper 4 is [the temperature of 400 micrometers and the heating grasping section 5 of spacing of 180 micrometers, the up-and-down heating grasping section 5, and the non-heating grasping section 6] 110 degrees C. After holding for 30 seconds in the state of drawing 2, as shown in drawing 3, it drew out slowly and covering 3 was removed with the resin layer 8. Such 20 samples were produced and the breaking strength of the optical fiber of the covering removal section was investigated. The conditions of a tension test are parts for 600mm [of gage lengths], and 10%/of strain rates.

[0015] The result was 5.5kg in the minimum value of 4.0kg, the peak price of 6.1kg, and average. Although this value does not attain to slightly a plastic coated fiber with a covering outer diameter [of Table 1] of 420 micrometers, it has doubled [about] compared with the plastic coated fiber with a covering outer diameter [of Table 1] of 250 micrometers, and satisfies enough the reinforcement required of high intensity connection of an optical fiber etc.

[0016] Next, after the ultraviolet curing mold coloring agent colored the plastic coated fiber used in said example (the thickness of a coloring agent is 7 micrometers), the mold of the resin layer was carried out like said example, ten samples which removed covering of the part with the resin layer by the hot stripper were produced, and the tension test was performed. The result became the minimum value of 1.5kg, the peak price of 6.0kg, and the average of 3.8kg, and became a thing inferior to said example. This is because the adhesion of the layer of a coloring agent and a resin layer is bad. There were not few in which the resin layer which carried out mold separates and falls, and covering of a plastic coated fiber collapses in this experiment at the time of covering removal. Especially, it began to draw out and collapse of covering of 5mm or more had generated the side in eight among ten.

[0017] Then, when ten samples which carried out the mold of the resin layer were produced and the same experiment was conducted after making the front face of the layer of a coloring agent apply and harden a primer before carrying out the mold of the resin layer, the minimum value of 3.5kg, the peak price of 6.1kg, and the average of 4.9kg were able to be acquired.

[0018] In addition, although the grasping section used what consists of the heating grasping section and the non-heating grasping section as a hot stripper in the above-mentioned example, the grasping section is able to use the thing of only the heating grasping section as a hot stripper.

[0019]

[Effect of the Invention] As explained above, according to this invention, a covering outer diameter can remove covering of a thin plastic coated fiber 300 micrometers or less, without making an optical fiber cause a big fall on the strength by the hot stripper.

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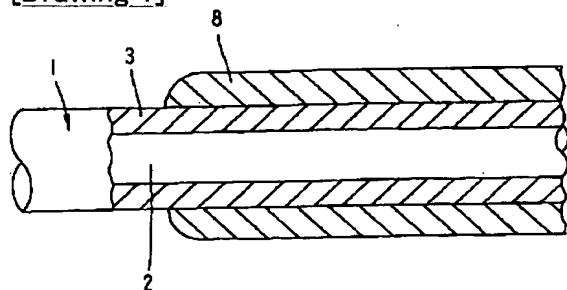
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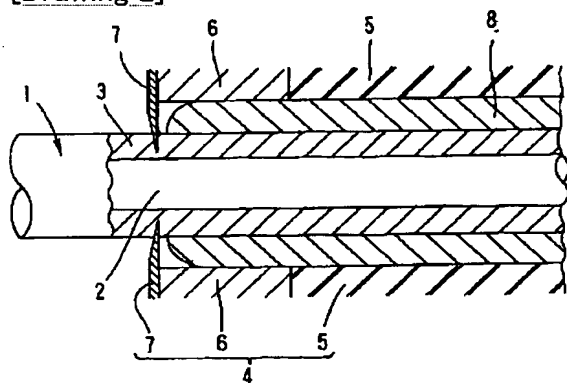
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DRAWINGS

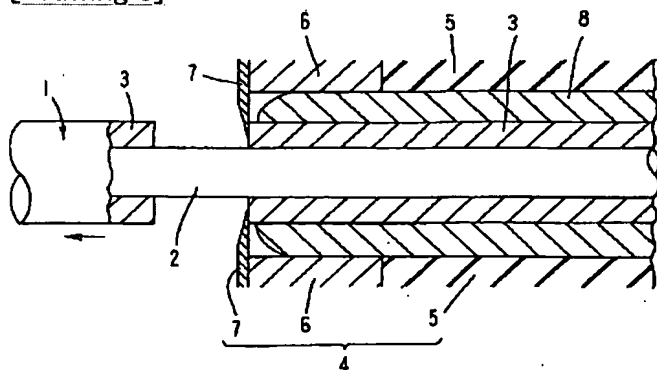
[Drawing 1]



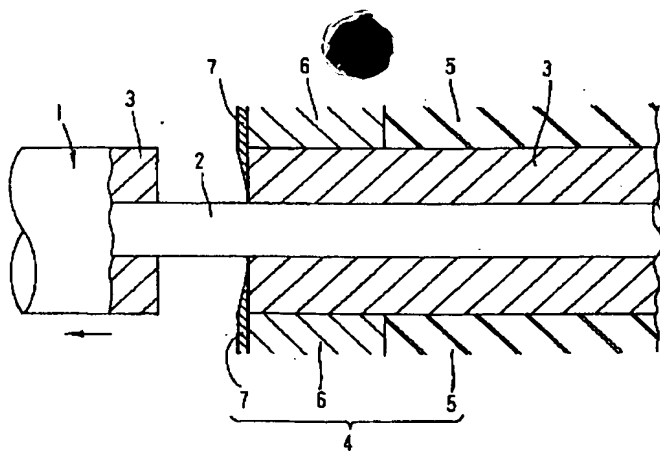
[Drawing 2]



[Drawing 3]



[Drawing 4]



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